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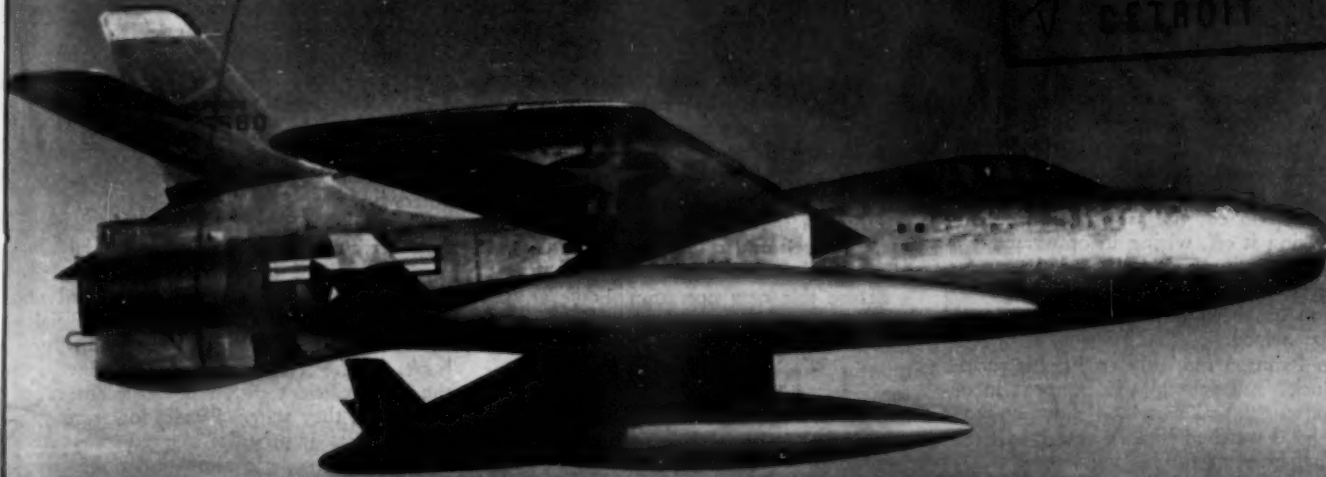
# SCIENCE NEWS LETTER

In This Issue—SCIENCE REVIEW OF THE YEAR

THE WEEKLY SUMMARY OF CURRENT SCIENCE

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Supersonic Combat

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A SCIENCE SERVICE PUBLICATION

## SURGERY

# New Heart Operation

**Skilful surgery is saving patients with ailment involving a ballooning of the aorta, known to doctors as aneurysm of the aorta.**

► THE PATIENT had a blood-filled sac almost as big as a basketball in his upper abdomen where the wall of the body's main artery, the aorta, had thinned and ballooned out. He was not expected to live more than a few months.

Today he is alive and well, thanks to new, skilful surgery which, since last February, has saved five other patients with the same ailment. Doctors call it aneurysm of the aorta.

The new operation, which has already saved six out of nine patients, was reported by Dr. Henry T. Bahnson of Johns Hopkins University School of Medicine at the meeting of the Johns Hopkins Medical Society in Baltimore.

What Dr. Bahnson has done in these cases is, briefly, to cut off the blood-filled sac and sew up the hole in the aorta wall which was the opening to the sac.

Surgeons have tried for many years to cure patients with this condition. Some have tried to cut the sac out, others have tried tying it off, wiring it, or wrapping it with reinforcing material. Results so far, however, have been poor and the general opinion has been that these patients could not be helped.

Dr. Bahnson modestly credits his success to "luck" and general advancement in operations on blood vessels. Fellow surgeons who have watched him operate credit skilful management for his good results.

The operation can be done, Dr. Bahnson

says, in all regions of the aorta. It is feasible, he pointed out, because of two features "which are not generally recognized." 1. The opening to the aneurysm, or the tear in the aorta wall, is usually small compared to the size of the aneurysm itself. 2. Although the aorta may show signs of disease, it often is able to function adequately, and with penicillin there is at least hope of arresting the inflammation and preventing disturbance of the big artery's function.

These aneurysms, or sacs, form on the sides of the aorta usually as a result of syphilis. This was true of all but one of Dr. Bahnson's patients. The exception was a nurse whose aneurysm developed after injury in an auto accident.

Even though syphilis now can be cured easily and quickly by penicillin treatment, doctors still see a number of patients with syphilitic aneurysms of the aorta who never knew they had syphilis and consequently never got treatment for it. Most of them are men in their forties who are otherwise perfectly well and can live if the aneurysm is removed successfully.

Before this new operation, however, the patients could live a year or two at most, the average living only eight or nine months. And while not all had aneurysms the size of basketballs, the smaller, golf-ball-sized ones caused pain in the chest, shortness of breath and obstruction to swallowing.

Science News Letter, December 20, 1952

## CHEMISTRY

# Chlorophyll No Deodorant

► A "DOUGHNUT that exists for the hole"—that is a chemist's description of chlorophyll, green coloring of plants, which is being put into everything from tooth-pastes to dog foods because of its supposed deodorizing power.

The supposed deodorizing effect of chlorophyll as well as some of the other properties claimed for it were debunked by Prof. Alsoph H. Corwin, head of the department of chemistry in the Johns Hopkins University, at a meeting of the American Chemical Society in New York.

The hole in the chlorophyll "doughnut," or ring structure, however, is fact, not bunk. It exists, Prof. Corwin said, for the purpose of holding metallic elements, which are thus made available for certain types of chemical reactions. In the case of chlorophyll, the metallic material is magnesium.

In hemin, the blood's red pigment, the metallic material is iron.

Chlorophyll derivatives taken by mouth to deodorize perspiration and other odors probably do not get into the blood stream in sufficient quantity to deodorize, and, if they did, they would be "extremely dangerous" in making their users sensitive to light, Prof. Corwin declared.

As a deodorant for foul-smelling wounds, Prof. Corwin said that "the experiments necessary to demonstrate that solutions of chlorophyll are in fact superior to those of common salt have not been performed."

Space deodorant devices which contain chlorophyll derivatives appear to freshen the air for two reasons, Prof. Corwin said: 1. They always contain a pleasant odor which can mask less pleasant odors; 2. Most such preparations also contain formalde-

hyde. The common action of this substance, he pointed out, is "so to paralyze the sense of smell that odors can no longer be detected."

"Chlorophyll is probably the most important pigment in the world," he said, "since it is ultimately responsible for the fixation of the energy of the sun by plants. This process, called photosynthesis, is the final source of all our food and a major fraction of our power."

Aside from this, chlorophyll has esthetic value in "coloring the vistas visible from hills and mountains. It furnishes chemists, physiologists and other scientists with a lot of good clean fun. For other purposes," Prof. Corwin stated, "we are not certain that it has any value."

Science News Letter, December 20, 1952

## AERONAUTICS

# Turbo-Compound Engines Give Planes High Speed

► A NEW type of power plant, what is called a turbo-compound engine, will be used in a version of a Constellation transport plane now ready to make its first flight. This type of engine, already tested for two years in long-range anti-submarine sea patrols, is a standard piston engine with special exhaust turbines to utilize power otherwise wasted.

This Super Constellation, equipped with four turbo-compound engines, will have a maximum speed approaching 400 miles an hour and a long-range cruising speed of 340 miles an hour, it is claimed by officials of the Lockheed Aircraft Corporation, Burbank, Calif. The engine is recognized as the most efficient piston power plant ever developed, they state. Besides lowering operation costs, it provides a speed and long-range performance combination unbeatable even by today's jet, they declare.

Utilization of what is otherwise wasted energy in the exhausts of piston-type engines gives this turbo-compound engine its efficiency. Three turbine mechanisms, operated by the exhaust gas, add extra power to the driving shaft of the plane, giving a speed increase of 50 miles an hour. They squeeze the otherwise wasted energy out of the gas, adding 25% in economy.

The new Constellation, now ready for flight, was constructed as a Navy R7V-1 transport, and will carry 106 passengers, 19 tons of freight, or 73 battle casualties on stretchers. A luxury commercial version with the same 3,250-horsepower turbo-compound power plants, built by Curtiss-Wright Corporation, will be ready for flight early next year. Twelve airlines have 69 of these transports on order, Lockheed officials state. The increased speeds made possible with turbo-compound engines will keep American planes competitive on all major airways until economical jet engines are developed.

Science News Letter, December 20, 1952

Weather maps describe the atmosphere only at the earth's surface.



## GENERAL SCIENCE

# Slowness Wastes Billions

There is no adequate bridge for the critical gap between theoretical research and actual application, Dr. Bush charges in annual report of Carnegie Institution.

► **WORTH NOW** three billions of dollars a year, the development of hybrid corn was ten years late because "practical" men failed to appreciate and develop the fundamental work carried out about three decades ago by Dr. George H. Shull in the Carnegie Institution of Washington's genetics laboratory.

This was charged by Dr. Vannevar Bush, president of the Institution and war-time head of U. S. research, in his annual report.

"We have no effective organization in the country as a whole for bringing the fruits of disinterested research to the point where they invite industrial development," Dr. Bush warned.

The most critical bridging of the gap between theoretical research and application at the present time, Dr. Bush said, concerns how to cash in on the discoveries that the green algae *Chlorella* will produce 56% dry weight of protein, of which the world is very short for food purposes.

## North Pole Shifting

The North Pole will not stay put; it has shifted 12 feet in 30 years, to the perplexity of scientists.

But now Dr. E. H. Vestine of the Department of Terrestrial Magnetism of Carnegie Institution has hit upon the answer. From studies of the earth's magnetic field, Dr. Vestine said that the field has been drifting steadily westward, and that there is a corresponding westward movement of the upper layer of the earth's liquid core that accounts for it.

Besides this large westward drift, Dr. Vestine also found smaller crosswise drifts of the liquid core that exert a force on the earth's axis.

Dr. Vestine explains it this way: the North Pole acts like a spinning top. The irregular forces from the transverse drifts act like a finger pushing against the base of the top. When this is done, the upper part of the top will move in the opposite direction from the push. Thus when the drifting earth's core pushes against the earth's axis, the pole shifts its position to oppose the force.

The momentum, or "push" of these transverse movements is adequate to explain the year-to-year variations of the pole's position, said Dr. Vestine.

## Ages of Minerals

The atomic calendar, holding the key to the age of the earth, has revealed more of its secrets during the last year.

Improved methods of radioactivity dating, being worked out at the Institution, have led to the measuring of the oldest rock known so far to man. The lepidolite mineral in rock from Manitoba, Canada, was found to be 3,500 million, three and one-half billion, years old.

Other ancient minerals dated by rubidium-strontium radioactivity measurements were from rocks in: Bikita Quarry, Southern Rhodesia, 3,300 million; Jakkalswater, South Africa, 2,400 million; Ingersoll Mine, South Dakota, 2,100 million.

Drs. L. T. Aldrich and G. R. Tilton of the Department of Terrestrial Magnetism, and Dr. G. L. Davis and L. O. Nicolaysen of the Geophysical Laboratory, reporting their joint work, told of promising new techniques in radioactivity dating.

Finding the age of rocks by their radioactivity depends on the constant rate of break-down of radioactive materials into various decay products. Uranium 238, for instance, will, through billions of years, finally decay completely into a lead isotope. Age of the material, then, can be found by comparing the ratio of it to its end product in a rock.

Up until now, only rarely-found concentrated ores could be used in dating. But by the new techniques, very small quantities generally distributed through granite rock can be measured and the rock dated.

Where only one or perhaps two determinations could be run on a single rock sample before, now, using the latest methods, many different substances can be analyzed from the same sample—thorium, uranium, lead, rubidium, strontium and potassium—each a check on the other.

This is made possible by separation of very small amounts of isotopes with ion-exchange resin columns, and their accurate measurement by the isotope-dilution technique and the mass spectrometer.

The resin columns are able to extract the smallest amount of an isotope from a mass of crushed granite. This tiny bit of material, which could not be easily or accurately measured by itself, is added to a larger known quantity of the same isotope. The effects of this small addition are then comparatively easy to observe and measure with the mass spectrometer.

This new method will allow far more different rocks to be dated than before possible, because it is not restricted to highly concentrated ores. It will also allow more samples of a single rock structure to be taken, thus affording a check. Furthermore, it is believed that radioactive materials distributed generally in granite show fewer age discrepancies than materials from ores.

Most of the previous work has been done with uranium and its lead end-products. More emphasis is now profitably being



**LOADING URANIUM SLUGS**—Ten pounds of the precious fissionable material are being put into the holes of an atomic reactor at the Oak Ridge National Laboratory of the Atomic Energy Commission. Openings in the shield are round, but each channel in the graphite cube itself is diamond shaped, giving a passage for cooling air. From such an atomic power producer come radiations that are being used in a variety of promising ways.

placed on the rubidium-strontium method of dating ancient minerals.

The oldest rocks dated so far were found with the rubidium-strontium determination, using the isotope-dilution method of measuring.

### Galaxies in Collision

Ghosts of dead stars that exploded hundreds of years ago and galaxies of stars in collision are sending out such strong radio signals that they have been picked up here on earth.

During the past year three of the outstanding radio sources of the sky have been identified by Drs. Walter Baade and R. Minkowski of Mount Wilson and Palomar Observatories of the Carnegie Institution of Washington and the California Institute of Technology.

Radio signals from the constellation of Cassiopeia were found to come from the center of a remarkable emission nebula. This is believed to be the expanding envelope of what may have been a supernova of the remote past.

Another strong radio source, located at the Cavendish Laboratory in England, is in the constellation of Cygnus, the swan. This was found to coincide with a galaxy of billions of stars like our own Milky Way, but far beyond the system of stars to which our sun and the earth belong.

"This nebula is a very queer object," the annual report of the Carnegie Institution of Washington states. "In fact, its structure seems to make sense only if it is assumed that we are dealing with two nebulae which are in actual collision."

Another strong radio source seems to be a mass of peculiar glowing filaments of gases, spreading out from the center at varying speeds. Except for its small size, this object in the constellation of Puppis, the ship's stern, resembles the one in Cassiopeia.

Drs. Baade and Minkowski have been co-operating with the active radio research centers in Australia and England in attempting to spot astronomical objects that are broadcasting the cosmic radio noise picked up here on earth. One of the first objects identified with a radio source was the Crab nebula, remnant of a galactic supernova of 1054 A.D.

### Mutation Process Described

Heredity-controlling cell structures are only indirectly changed by mutation-causing agents (mutagens), Dr. M. Demerec, geneticist with the Institution, has discovered.

Dr. Demerec said various chemicals and ultraviolet radiation used to cause changes in genes, bearers of hereditary traits, affect the general metabolism of a cell primarily. The changes in the gene follow as a result of the metabolism change.

Dr. Demerec described the process of induced mutation like this: A mutagen acts upon the cell material, cytoplasm, to cause a change in the cell metabolism. This change in the cell "climate" then affects

the genes. Some of the genes are stable and do not react to the change, but others show some differences which then affect the hereditary structure of the cell.

Another discovery in genetics from Carnegie Institution of Washington laboratories was that increased heat seems to speed up the process of mutation. Geneticist Evelyn Witkin found that the one-celled organism, *Escherichia coli*, showed a greater rate of both spontaneous and induced mutations with an increase in temperature.

Dr. Barbara McClintock reported she found that the carriers of genes, chromosomes, also bear another functional genetic unit. This second unit controls the time and degree of action of the genes.

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### NUTRITION

## Average American Eats 12% More Than Pre-War

► THE AVERAGE American consumes 12% more food now than he did in pre-war years.

Furthermore, he is indulging his taste for more expensive kinds of foods, Dr. Frederick V. Waugh, agricultural economist, told the National Food and Nutrition Institute in Washington.

Although the average American eats more food now, he has not increased his intake of calories from the 1935-39 period. He eats less starchy material, about the same amount of vitamin A and a little more vitamin C. He gets considerably more riboflavin, thiamine, niacin, iron, protein and calcium now than in pre-war years.

In terms of food, the average American now eats fewer potatoes and grain products, but more meats, citrus fruits, tomatoes, leafy green and yellow vegetables.

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### GENERAL SCIENCE

## Temperature Inversions Cause "Flying Saucers"

► THE CIVIL Aeronautics Authority has now confirmed that the "flying saucers" seen on radar scopes at National Airport near Washington last July were the results of temperature inversions bending the radar waves. (See SNL, Aug. 9, p. 82.)

"Correlation of controllers' reports with Weather Bureau records indicated that a temperature inversion almost always existed when such targets appeared on the radar," the CAA said. The radar beams were bent downward by the inversions to give the operator a ground reflection on his radar scope. The inversion areas traveled with the speed of the wind, but horizontal movement of the areas produced a speed on the scope apparently twice as great as the wind speed.

The CAA report did not mention the lights seen occasionally along with the more numerous radar echoes. A spokesman said

this was because the lights did not interfere with traffic control at the airport, and were thus of little interest to CAA.

A meteorologist stated that, while the temperature inversion explanation for the radar echoes is quite reasonable, it would take quite terrific temperature inversions, which occur only rarely, to produce visual light reflections from the ground.

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Using radioactive tracers, scientists have found that a hormone-type weed-killer was carried throughout a bean plant's system in 30 minutes.

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## GENERAL SCIENCE

# 1952 Science Review

**History may know 1952 as year of H-bomb. Year's medical advances include drug that could conquer malaria, new anti-TB drug, promising steps toward polio protection.**

*This summary of the year's happenings in the world of science is limited by space to just the highlights. Most of the events are described in detail in the pages of SCIENCE NEWS LETTER for the current year. If you wish to refer to any particular report, you may find it readily through the index. (See SNL, June 28, and also the issue which will appear next week, Dec. 27.)*

**By SCIENCE SERVICE STAFF**

► THE TOPS in 1952 science, as well as tops in energy loosened by an act of man, was the hydrogen bomb, which presumably was achieved in secret Eniwetok tests.

We cannot be sure just what happened, but if scientists succeeded in transmuting or fusing tritium, the triple-weight isotope of hydrogen, into helium with mass lost converted into tremendous energy, the world has a new power source ranking with the fissioning of uranium and plutonium and the burning of fuels.

There is speculation, fed by the secrecy of the atomic energy program, that this hydrogen-helium conversion might even take place, slowly, without the trigger action of the immense sun-like heat of the plutonium bomb that is believed used to set off a hydrogen bomb. This would be of immense importance. But those not in secret circles can only surmise.

Atomic energy progress announced included the operation of the world's largest accelerator of atomic particles, the cosmotron at Brookhaven National Laboratory, that will rival the cosmic rays with energies up to 3 billion electron volts. Even this is only the beginning, for accelerators that will double and perhaps triple that energy are actually building, and the scientific possibilities of a machine operating at 100 billion electron volts were demonstrated during the year.

Application of atomic power to military uses made gains during the year. The keel of the year's first atomic submarine was laid, engines for it are underway, as are atomic power plants for an aircraft carrier and even airplanes themselves.

In man's continuing fight against disease, the most exciting progress was the successful testing upon prisoner-volunteers of a new drug that in very small doses both cures and prevents malaria. For the first time there is the hope of eradicating this mosquito-carried disease that is rated the world's No. 1 ill, killing 3,000,000 annually and afflicting a quarter of the earth's population.

To join with streptomycin in fighting tuberculosis by chemical methods, a new drug, called isoniazid, came into use, with encouraging results to supplement the older

method of fighting the great white plague.

In a year that saw infantile paralysis cases rise to an unusually high level, there was a mass test of the effectiveness of injections of the gamma globulin fraction of human blood in protecting children against polio. It seems to have worked, cutting the expected paralytic polio cases in half. This method will undoubtedly be used on a larger scale in 1953.

Two promising approaches to a vaccine were made. Virus was grown in eggs which may lead to a useful vaccine. Another vaccine method may give protection against all three types of polio, which were shown to be all the types that cause epidemics.

Promising progress was made in perfecting and using on human patients machines that can take over during operations the functions of the heart and other organs, while some attempts were made to transplant kidneys and lungs.

In electronics and communication, more use was made of transistors, the semi-con-

ductor devices that can do some of the things that vacuum tubes usually do.

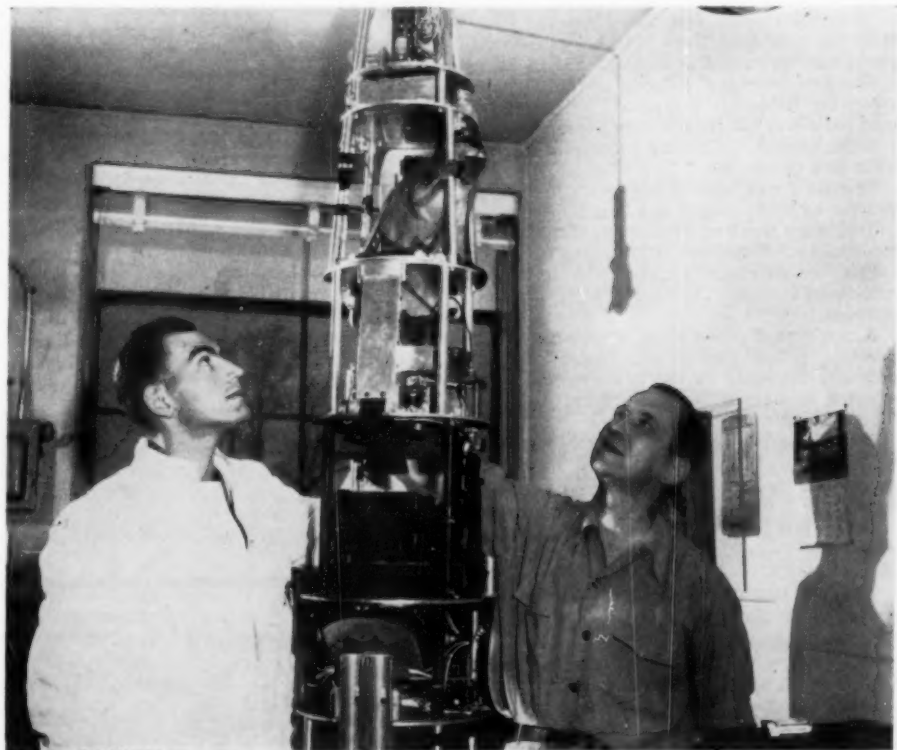
The automatic factory and the mechanized business office are being foreshadowed by some of the developments in electronic automatic control mechanism.

There has been the hope that electronic computers could be applied to weather forecasting, which now is a matter of human experience and judgment. The mechanical "brains" progressed during the year so far that there is hope that large masses of numerical weather information can be fed into them to secure weather forecasts in the future sufficiently fast to be useful.

Jet airliners of British manufacture began commercial service between London and South Africa, marking an aviation epoch. Hidden largely under cloak of secrecy, more progress was made on jets for military use. We learned that a U. S. experimental plane in 1951 flew almost twice the speed of sound, and wind tunnel research is being conducted in the region of as high as seven times the speed of sound.

Much such advanced aviation research is aimed at bigger and faster guided missiles, pilotless craft that could reach any part of the world from any part of the world, carrying atomic warheads. We may be sure that already long-range missiles, which may outmode both pursuit plane and bomber, are flying. Some of them will soon be in production.

One of the consequences of radiocarbon dating, itself a by-product of the atomic



**HISTORIC ZERO-GRAVITY FLIGHT**—One of the monkeys which was rocketed nearly 40 miles into space. Results showed that man may be able to stand the gravity-free state for brief periods.

age, is the discovery that petroleum is being formed contemporaneously in the oceans from the debris of marine life. This explodes the theory that oil formation took millions of years of geologic time. Oil was recovered from the slime of off-shore seas and its high radiocarbon content showed it to have been formed recently.

Archaeologists reported that they had found that Jericho has been inhabited continuously for 6,000 years, which makes it the oldest city now existing.

In the heavens, something new was discovered about the great galaxy of stars, the Milky Way, in which we exist. It has spiral arms, detected both through light reaching optical telescopes and radio waves reaching radio telescopes.

The collision of two great aggregations of stars far distant from us in the universe was detected and located by very short radio waves received by radio telescopes. These nebulae are similar to our own Milky Way but so far away that it takes light millions of years to reach us. The newer method of observing both light and radio radiations produced convincing evidence that a gigantic meeting of nebulae has been spotted for the first time.

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#### AERONAUTICS

### First Civilian Jetliner Starts Passenger Service

The world's first civilian jet airliner went into service, carrying 36 passengers between England and South Africa.

The greatest speed ever flown by man, 1,300 miles per hour in a Navy NACA experimental plane, was announced as accomplished in 1951.

The first helicopter crossing of the Atlantic, using the Labrador, Greenland, Iceland, Scotland route was successfully completed.

A high-speed, delta-wing interceptor aircraft went into production.

Television was used to improve radar reception for air traffic control at a busy airport.

Turboprop engines became standard equipment in an AF medium cargo transport.

Fast 100-passenger airliners with turboprop propulsion for long-range routes went into construction.

A new type of power plant, a turbo-compound standard piston engine with special exhaust turbines, was ready for use in a transport plane reported to have a maximum speed near 400 miles per hour.

Major progress was made in setting up very-high-frequency omnirange stations, blanketing the nation to guide pilots on cross-country flights.

Gas turbine and jet engines were used in seaplanes and flying boats, giving them the speed of land planes.

Britain's steam catapult for launching jet aircraft from Navy carriers was experimentally adopted by the U. S. Navy.

A revolutionary method of catapulting and belly-landing aircraft on land by catching it in a flexible sheet was developed.

A Northrop F-89D with rocket cannons in the wingtips instead of near the fuselage was announced.

A turbojet engine was developed that has, with its afterburner, a thrust giving approximately 25,000 horsepower.

A triple-deck freight airplane with room for eight automobiles, 42 passengers and crew was under construction.

A new means for bailing out of jet planes traveling at great speeds was developed; the whole cockpit is ejected by a rocket charge and parachuted to earth.

An American airbase at Thule, Greenland, 900 miles from the North Pole was opened, facilitating Great Circle flights over the top of the world.

Civilian polar air route from California to Denmark via new North Greenland defense airport at Thule was opened by an American-built Scandinavian airliner.

Airways criss-crossing the nation were given route numbers like highways.

An altimeter for use in the thin upper atmosphere was developed, using Geiger tube measurement of cosmic ray intensity as indicator of height above the earth.

A speed record of 699.9 miles an hour was made by a North American Saber jet plane at low altitude.

The "baby blabbermouth" radio signal used a recorded voice to identify stations on the VHF omniranges for aircraft.

#### ANTHROPOLOGY-ARCHAEOLOGY

### Radiocarbon Dates Give Time of Migration Waves

Radiocarbon dates were interpreted to indicate that America was originally peopled by a long series of waves of migration, beginning more than 17,000 years ago and greatly stepped up 3,500 to 4,000 years ago.

Radiocarbon dating indicated that the ancient Dorset people, "ghosts of the Arctic," really lived in New York some 5,400 years ago while the north was still literally frozen.

Fluorine and other chemical tests of some North American human and extinct animal bones indicated that man was contemporary with some of the late Pleistocene animals.

Clovis fluted stone points, weapons used by early American man, were found for the first time in direct association with remains of a mammoth in Arizona.

Close to where 11,000-year-old Tepexpan Man was found in Mexico, discovery was made of man-made obsidian weapons and the bones of long-extinct elephants.

Superior flood control and irrigation devices were found in Arabia where they were in use a thousand years before the birth of Christ.

A new geochemical method for dating ancient human sites was developed, based on the fact

that where man makes his home he enriches the soil with chemicals, especially phosphorus and nitrogen.

Maize pollen grains, at least 2,500 years old, were found 240 feet below the surface of the lake bed on which Mexico City was built.

The shifting of archaic Mexican culture to the highlands and the return of the Nahuatl to the Basin of Mexico about 800-900 A.D. have been connected with climatic changes and resultant changes in lake level.

Excavations at the Biblical town of Jericho showed that people built houses and a city wall before they had learned to make pots, and that Jericho had a continuous history of at least 6,000 years.

Excavations at Nippur in modern Iraq, holy city of the Sumerians, yielded a large body of material representing the world's oldest literature and important sculptures.

Large jars in which Jewish people of the first century A.D. preserved ancient Biblical manuscripts were reassembled from fragments found in caves near the Dead Sea.

Digging was resumed at the important archaeological ruins of Pompeii where important Roman paintings have been unearthed.

Evidence of two-story construction in King Nestor's palace in ancient Greece and books on clay tablets, preserved some 3,000 years by the fire that hardened them while it destroyed the palace, were finds reported near Pylos.

A fifteenth century archer's helmet was plowed up in New Mexico and was believed to be part of the "surplus" with which the Spanish founder of the town equipped his expedition.

Human bones from the Mariana Islands showed the presence of yaws, a syphilis-like disease, in the South Pacific 1,000 years ago.

The same general pattern of social change is going on in widely separated parts of the world, it was found.

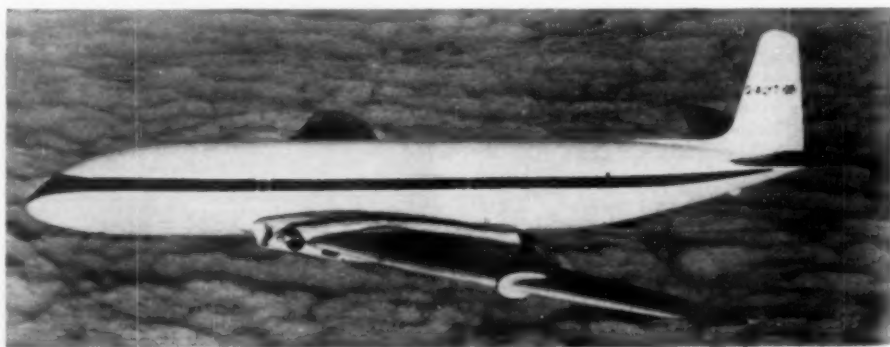
An anthropological laboratory was established in the highlands of Peru to test the effect of modern health, agriculture, education and industrialization measures on indigenous peoples.

#### ASTRONOMY

### Trace Spiral Arms of Milky Way Galaxy

The spiral arms of our galaxy were tentatively located by tracing the shining nebulosity in Milky Way fields and measuring with radio telescopes the neutral hydrogen in the space between the stars.

Upward revision of the scale of brightness of Cepheid stars, used as a stellar yardstick, placed the Magellanic Clouds, Andromeda Nebula and



**COMET JETLINER**—Future versions of de Havilland Comet, put in regular service in 1952, will resemble the jetliner shown here. Powered by Rolls-Royce "Avon" engines, it will carry 44 passengers, with freight and mails.



nearly all external galaxies farther away than previously estimated.

Technetium, first chemical element to be discovered through atomic bombardment, was identified in the spectrum of red S-type stars.

Radio star in Cassiopeia was identified as the expanding envelope of what may have been a supernova of the remote past, and the source of radio signals from Cygnus was found to be a pair of galaxies apparently in collision.

A low-luminosity variable star in the southern constellation of the Phoenix was found to have the shortest known period of 80 minutes; a record star eclipse lasting 17 years was reported for a double star in constellation of Centaurus.

Twin coronagraphs for Fremont Pass, Colo., and Sacramento Peak, N. M., were completed; construction was begun on a new type of telescope to be used as a regular Newtonian reflector, as a Cassegrain reflector and as a Schmidt-type instrument; plans for the world's largest radio telescope, a 250-foot basket-shaped affair, were announced.

A method by which the heavier elements—carbon, oxygen, neon, silicon, etc.—can be built up in the hot stars out of helium atoms created from primordial hydrogen was suggested.

Spectroscopic observations substantiated the belief that helium is being burned by transmutation into carbon in the extremely hot cores of some of the older stars.

Midget star only about one-third as large as the earth, the smallest known star and one of the faintest, was discovered.

Carbon monoxide gas was found definitely to exist in the sun's atmosphere; hydrogen and helium were identified in the atmospheres of the distant planets Uranus and Neptune.

Novae seen to blaze forth include three in the constellation of Scorpius, two in Sagittarius, one each in Ophiuchus and Scutum; Eta Carina was found to be brightening again.

New comets discovered include Harrington-Wilson, Mrkos, Peltier, Harrington and a second Mrkos.

The sidereal year, the time it takes the earth to complete one trip around the sun, was recommended as a new standard of time to replace the mean solar day.

A corona of stars about four hundred million billion miles in radius was reported to completely surround our Milky Way galaxy of stars.

Northern lights were reproduced artificially through use of an atom-smasher.

Twin stars in the constellation of Cygnus were found to race around each other at the rate of over 1,500,000 miles an hour, the greatest value yet discovered.

In the Small and Large Clouds of Magellan, closest galaxies to our own, 42 eclipsing stars were spotted, the only ones except two recorded beyond our Milky Way system.

Many of the brightest stars in the heavens were estimated to have been created since life began here on earth.

Over a hundred blue stars, each at least 6,000 times as hot as our sun, were spotted in the Northern Cross region.

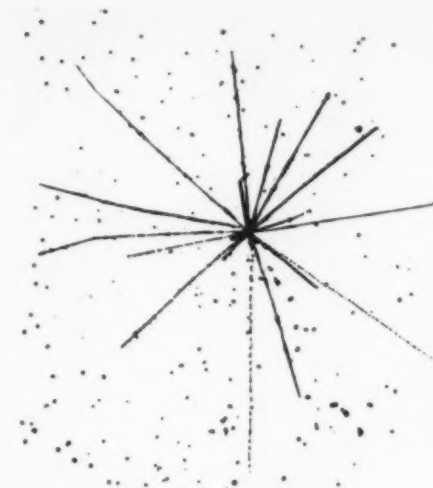
The hisses of a noisy radio star were noticeably reduced as the sun passed between the star and the earth.

#### BIOLOGICAL SCIENCES

### Flesh of Superbison Preserved 28,000 Years

The flesh of a superbison, preserved in the permanently frozen ground of northern Alaska, was found by radiocarbon-dating to be over 28,000 years old.

Fossil remains of *plioptithecus*, the "missing link" between the modern gibbon and its evolu-



**MAN-MADE ATOMIC "STAR"—**  
*A photomicrograph of the first photographic film emulsion exposed to two-billion-volt nuclear particles in the cosmotron at Brookhaven National Laboratory, Upton, N. Y. The incoming particle, believed to have been a neutron and therefore invisible, hit the nucleus of an atom of the emulsion, exploding it into 17 different visible particles that formed tracks in a star-shaped pattern.*

tionary ancestors, were discovered in a limestone deposit in Czechoslovakia; although gibbon-like, the fossil ape did not have the specialized long arms of the gibbon.

For the first time a virus-like crystalline substance was isolated from animal growth; it was obtained from human warts.

A lethal gene that affects the sex ratio, resulting in two females for every male born to a stock of mice, was discovered.

A species of giant toad, measuring at least eight inches in length and weighing about two pounds, was discovered in South America.

A technique was developed for transplanting fertilized egg-cells of mice into a foster mother mouse; thus mice can be produced that are not related genetically to the mother that gives birth to them.

Concerted efforts between Near-East nations and the United States brought about control of locust plague for the first time in history.

Use of santobrite, a poison, may make possible almost complete eradication of the snails that carry oriental blood flukes, cause of schistosomiasis in man.

Widespread outbreaks of the epidemic hog disease, vesicular exanthema, occurred.

A fatal virus disease of sheep, scrapie, appeared in the U. S. for the first time in California flocks.

Foot and mouth disease broke out in the cattle country of Saskatchewan, Canada.

The insect-killing power of DDT sprayed on walls was prolonged by a preliminary spraying with a phosphate solution.

Sheep may bear two litters a year through treatment with a newly developed sex hormone, ECP, it was predicted.

Experimental breedings between Red Sindhi bulls of India's tropics and temperate climate Jersey, Brown Swiss and Holstein cows yielded crossbreeds with large milk production in tropical and semi-tropical lands.

A feed supplement containing aureomycin and vitamin B-12 increased the laying of low-producing hens as much as 57%.

Work proceeded on an attempt to make photosynthesis occur outside living cells; if successful, this would make possible food production without living plants.

Yellow-dwarf, virus disease of oats, wheat and barley and spread by aphids, hit California in epidemic proportions.

Stems of bean seedlings were found to absorb streptomycin and cause it to move up into the leaves in sufficient amounts to suppress development of halo blight disease.

A marine biologist discovered three tropical woods that appear to be immune to attack by ship worms.

Plants were made poisonous to the insects that bite them by using insecticides the plants can take up into their roots, leaves and stems.

Exposure to slow neutron radiation was found to alter the sex ratio of hemp plants.

#### CHEMISTRY-PHYSICS

### Eniwetok Tests Add to Thermonuclear Research

The Atomic Energy Commission announced tests at Eniwetok and said that "the test program included experiments contributing to thermonuclear weapons research," which was interpreted to mean that a hydrogen (tritium) fusion type bomb had been achieved.

A pilot reactor that has its fissionable material in the form of a mudlike slurry started operation and reached criticality.

A scintillation probe was developed for prospecting bore holes for underground radioactive ore.

Effectiveness of lubricants was tested by making one gear radioactive and measuring the radioactivity of particles in the oil stream.

Tritium was found to be no more dangerous than other forms of radioactive material when used as a tracer in biological research.

In the cosmotron at Brookhaven National Laboratory protons were accelerated to 2.3 billion electron volts, the highest energy to which fundamental particles have been accelerated; energies up to 3 billion electron volts are expected to be achieved.

Construction was started on a land-based prototype of the submarine intermediate reactor which, with its liquid metal coolant, will be housed in a spherical steel building.

The keel plate was laid for the first atomic submarine.

The first non-governmental research reactor was placed under construction at the North Carolina State College campus.

A low power research reactor shielded by a "swimming pool" of water, intended for experiments on improved radiation shields, was announced.

With a football-sized core, the National Reactor Testing Station in Idaho, using fast neutrons, was started on a program to demonstrate the possibility of breeding, or producing more nuclear fuel than is consumed.

The Materials Testing Reactor, capable of producing the highest neutron flux achieved so far in this country, went into operation at the National Reactor Testing Station in Idaho.

Electric light bulbs were lighted by the first useful electric power from atomic energy at the experimental breeder reactor of the National Reactor Testing Station.

A public demonstration was staged of an atomic bomb explosion, the third witnessed by the press.

The British exploded their first atomic bomb in Australia.

An atomic accelerator was under construction in Australia, and the Japanese advanced plans to replace a cyclotron destroyed by American occupation troops.

Paper was made of glass fibers to filter out radioactive dust.

Ion exchange plastics in membrane form were developed to desalt sea water continuously and perform other extractions of chemical substances from liquids.

Elusive V-particles, produced when a cosmic ray proton or neutron strikes the nucleus of an atom, were routinely photographed daily on top of Mt. Wilson, Calif.

A new subatomic zeta neutral particle, which lives for less than ten quadrillionths of a second and decays into two pi mesons of opposite sign, was discovered on photographic plates exposed at altitudes over 12 miles.

The theory that "empty" space is filled with an all-pervading ether was revived by Dirac as being in harmony with new electrodynamics ideas.

The theory that creation of matter in the universe is a continuous process was advanced.

The energy expended by an average thunderstorm was computed and found to equal that of 50 Hiroshima-type atomic bombs.

Radioactive tritiated stilbene was used as a constant light source to standardize phototubes.

The transistor, tiny germanium crystal device, was adapted to function at very high frequencies and so can be used in television or FM apparatus.

Six new compounds were found to serve as superconductors at extremely low temperatures.

Impure silicon shows an electronic specific heat at very low temperatures which can be removed by neutron bombardment, but which reappears upon subsequent heating.

Water can be purified by high frequency, high intensity sound and by radiation from atomic furnace wastes, it was announced.

The complete synthesis of morphine was accomplished, but it is not a commercial process.

Total synthesis of cortisone was achieved in a single, uninterrupted series of 30 steps.

Microbiological synthesis of cortisone from progesterone and other available steroids was achieved.

The chemical structure of the antibiotic, terramycin, was found to consist of carbon, hydrogen, nitrogen and oxygen atoms with four rings of six carbon atoms each fused into a bar pattern.

The structural formula for aureomycin was worked out, showing the drug to be amphoteric and high in oxygen content.

For the first time nucleic acid was isolated in its whole, pure state.

First direct evidence that proteins are built in a succession of steps from simple to more complex compounds was found.

An organic arsenic substance, called A-42, was synthesized and found to be extremely effective against insects while being relatively harmless to human beings and animals.

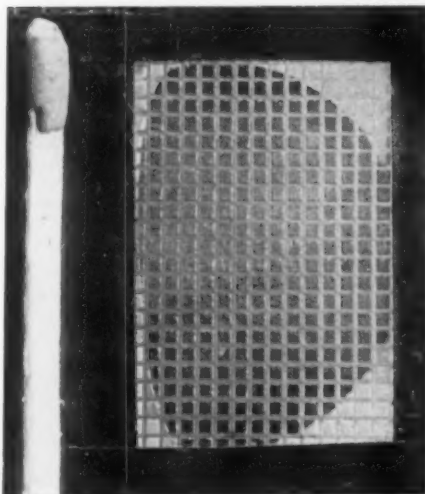
The origin of petroleum was illuminated through discovery by radiocarbon dating that hydrocarbons are accumulating in tidelands at the present time as debris from marine life.

Giant single nucleic acid molecules, such as present in chromosomes and genes, were seen for the first time, with the aid of the electron microscope.

Development of new types of fertilizer containing phosphoric acid promised to relieve the shortage of sulfuric acid and at the same time to aid in by-product uranium recovery.

Radiochemical methods were developed for the detection of trace quantities of minerals through use of neutron irradiation.

A method for detecting underground deposits of uranium and vanadium was developed through study of the kinds of plants growing



**WAFER FOR TRANSISTOR**—A match indicates the actual size of this germanium wafer used in producing transistors, tiny devices that can do the work of vacuum tubes.

on the surface and chemical analysis of their leaves.

Synthetic rubber was made more resistant to exposure to ozone by blending with a polythene.

Polyacrylonitriles were produced which change the structure of clay, making it porous and suitable for growing plants.

The Nobel prize for physics was awarded to Drs. Felix Bloch, Stanford University, and Edward M. Purcell, Harvard University, for independent work on use of amplified radio frequencies to study the structure of the atomic nucleus.

The Nobel prize for chemistry was awarded to the British biochemists, Dr. Richard L. Millington Syge and Dr. Archer I. Porter Martin for developing the process of chromatography.

#### EARTH SCIENCES

### Predict Weather by Electronic Calculator

A method of predicting the weather 24 hours ahead by use of an electronic calculator which works on a step-by-step, hour-by-hour basis was announced.

Winds of more than 1,100 miles an hour in the extremely thin air 65 to 100 miles up in the sky were measured by radar-like instruments; average wind velocity at that height was found to be between 150 and 200 miles an hour.

Scientists suggested that steady monsoons, striking constantly against the Himalaya mountains and air masses over Asia, are the cause of seasonal changes in the position of the North Pole.

The Air Force established a permanent weather station on an "ice island" close to the North Pole.

Tracking of jet streams, 200- to 300-mile-an-hour air currents about 30,000 feet above the earth, was begun, using jet planes.

Accurate forecasts of flood crest five to 15 days before occurrence, and general warnings issued more than a month before were responsible for an estimated \$100,000,000 saving along the 1,600-mile length of the Missouri River from North Dakota to Missouri.

Thirty-five major sea mountains, from 3,500 to 12,400 feet high, were found to rise from the floor of the Gulf of Alaska.

Oilmen pushed the method of increasing oil production by pumping water into seemingly exhausted wells; water injection into a central well drives oil to the pumping wells, adding greatly to the efficiency of oil extraction.

Study of Alaskan weather records for a 50-year period seems to indicate that Alaska has slowly warmed up; once ice-bound ports are now open for short periods in the summer.

Primary uranium ores were located in New Jersey, the first indication that primary uranium might be found in the Appalachians.

Extensive deposits of monazite, a thorium-bearing mineral, were discovered throughout a 700-mile area in the southeastern states.

Prediction was made that the Williston Basin of the Dakotas and Montana may be one of the major oil fields of America.

A deposit of an extremely rare mineral, nasonite, was discovered in California; the only other known place that nasonite occurs is in New Jersey.

Paracutin, the volcano that dramatically and unexpectedly burst forth from a Mexican cornfield, was declared dead this summer after nine years of intense activity.

Crater Elegante, huge hole in the earth's surface in Mexico, was caused when a volcano collapsed some 25,000 years ago, it was reported.

Ash Heap Crater, long believed extinct, erupted; this is its first known volcanic eruption in historic time.

Scientists determined that a particular parcel of air will scatter and diffuse into an area 1,000,000 times its original size in as short a time as two hours.

Fossil pollen studies of lake sediments in Mexico and New Mexico provided a continuous record of climatic changes extending back into the glacial period.

Earthquakes of the year included serious shocks in California, Japan, Argentina and Kamchatka.

#### ENGINEERING-TECHNOLOGY

### Atomic Cannon Is Put in Production

A 280 mm cannon with double recoil mechanism that can fire either conventional or atomic projectiles was put in production.

A four-mile-long bridge over the Chesapeake Bay, longest continuous steel structure over water in the world, was opened to traffic.

"Scatter sounding," a technique for informing a radio operator of how well his signals are received in remote places, was developed.

An electronic digital computer was put into mass production.

The life of jet engines was greatly increased by coating with chromium glass the heat-resistant molybdenum metal used in them.

An electromagnetic pump, ancient instrument, was revived for use in the AEC breeder reactor for pumping "hot" metals.

A new medium tank, with one-piece cast hull that affords a poor target for enemy shells, was announced.

A mixture of blackstrap molasses and bunker fuel or asphalt was used to make beach sands hard enough for heavy military equipment.

A device for preventing an explosion when a bullet strikes an aircraft fuel tank was developed; it releases carbon tetrachloride to stop fuel gases from building up explosive pressures.

Logarithm tables accurate to 23 places and useful for numbers up to 99 sextillion were published.

Synthetic motor oils that lubricate truck and





**AID BIOCHEMICAL STUDIES**—Monkeys have always been one of the most valuable laboratory animals because their biochemistry most resembles that of humans. Here, Donald Tappan (left) checks the result of a nutritional experiment with Dr. C. A. Elvehjem at the University of Wisconsin.

automobile engines satisfactorily even under Arctic conditions were announced.

Work was advanced on methods for recording television programs on magnetic tape.

A way of preventing air pollution caused by ferromanganese blast furnaces by washing down the dust particles in the furnace gases was developed.

A "Walkie-Lookie," portable television camera for spot news coverage having a built-in power supply, was developed.

The transistor went into use in customer long distance dialing service.

An adjustable diesel locomotive was developed that can run on tracks ranging from the United States standard up to the widest gages in use.

Electronic scales buried under highways were used to weigh moving vehicles.

The British navy developed two new television cameras for underwater work, to be used in salvage and hull-inspecting operations in situations where divers can not be used.

#### MEDICAL SCIENCES

### Polio Vaccine Gets First Successful Trials

A vaccine against all three types of polio virus got its first trials on children with gratifying results in increasing protective antibodies in the blood.

Success in getting one polio virus strain to grow in developing chick embryos gave hope of another polio vaccine that could be given by mouth.

Gamma globulin from human blood can more than cut in half the likelihood of children getting paralytic polio, trials involving 55,000 children showed.

Discovery that the polio virus is in the blood for a few days before attacking brain and

nervous system increased hope for success with anti-polio vaccines and medicines.

A fairly simple and inexpensive test for polio infection and immunity was announced.

Evidence that only three different polio viruses exist was obtained.

Pyrimethamine, tradenamed Daraprim, was reported the most powerful anti-malaria drug yet known, acting as a suppressant cure, with the further advantages of being tasteless, odorless and cheap.

Primaquine proved effective in preventing relapses of malaria in returning Korean troops.

Isoniazid, synthetic chemical known by several trade and chemical names, was announced as effective in tuberculosis, although TB germs soon developed resistance to it, and as promising in preliminary trials in Hansen's disease, or leprosy.

Two chemicals, spermine and a protein of unknown identity, which together have a poisonous effect on tuberculosis germs, were found in blood serum and body tissues.

Discovery of an anti-TB germ substance in lymph nodes of tuberculous cattle was announced.

From behind the Iron Curtain (Poland) came news of three new anti-tuberculosis chemicals, hydroxamic acids named T 40, T 95 and T 139.

Successful birth control by pills made of the chemical, phosphorylated hesperidin, was achieved by 298 out of 300 couples.

The escape route of red blood cells from an Rh-positive baby to the blood stream of Rh-negative mothers during pregnancy was traced through fragile capillary junctions leaving red infarcts on the placenta.

The nerve-gas type insecticides such as Parathion, and probably the nerve gases too, can have their dangerous skin-penetrating power reduced through a new kind of emulsifier obtained when ethylene oxide is added to a phenol of high molecular weight.

An antidote to Parathion and some other nerve-gas types of insecticides, and maybe to the nerve gases themselves, was discovered in the scopolamine derivative, Buscopan.

The first successful antidote to beryllium poisoning was found in aurin tricarboxylic acid.

An artificial heart-lung machine was used successfully on a human patient.

A new filter device was developed by the Army Chemical Corps to detect and identify germs in the air in 15 hours instead of almost four days.

Ugly, painful keloids in wound and burn scars were successfully treated with the enzyme, hyaluronidase.

For the first time scientists succeeded in extracting from living tissue a water-soluble substance which can make fat.

Two hormones from the pituitary gland, oxytocin and vasopressin, were isolated in nearly pure form and, for the first time, separated from each other.

Synthetic production for the first time of a B vitamin, the phosphate form of pyridoxamine which may give scientists a chance to learn more about cancer and nutrition, was accomplished.

A new B vitamin, lyxoflavin, with growth stimulating effects for rats and relaxing effects in human high blood pressure patients was synthesized.

A new vitamin factor, called biocytin, has been made artificially.

Discovery that the conversion of carotene to vitamin A is impaired in experimental diabetes was announced and called the first step toward discovery of an agent to control premature aging of the arteries (arteriosclerosis) in diabetics.

A chemical test of saliva that tells whether a boy or a girl baby will be born was developed.

The first hereditary link with the boy-girl ratio in human births was found in blood observations.

Intravenous use of Fraction I (fibrinogen) from human blood to treat uterine bleeding during pregnancy was successful in seven cases.

Living animals have, for the first time, been studied in a weightless, or gravity-free, condition.

Discovery of the first antibiotic chemical capable of stopping trypanosomes, a protozoan family whose members cause deadly African sleeping sickness among other diseases, was announced.

A new chemical, dimethylamino-isopropyl-phenothiazine, that promises to allow human whole blood to be preserved for longer periods than now possible was reported.

Experiments gave hope that human blood red cells can be stored at very low temperatures for long periods of time and still be useful for transfusions.

Successful gland transplantation in humans, giving hope of sex rejuvenation, was achieved by use of fetal instead of adult tissues.

A new anti-rheumatism chemical, phenylbutazone, or Butazolidin, was announced.

The B vitamin known as pantothenic acid was reported needed by the body to manufacture cortisone.

Cancer cell spread, called metastasis, was produced experimentally in mice for the first time.

First steps toward a skin test for detecting cancer through changes in electrical resistance were taken.

A definite trend toward more leukemia, and slightly more mutational abnormalities in children of those residents of Hiroshima and Nagasaki who got large doses of irradiation from the atomic bombs has been found.

The one-celled parasites called amebas, which cause amebic dysentery, were grown in pure culture for the first time in medical history.

Phantom limb sensations are being used to work an electrical arm under development in Germany.

Encouraging results in preliminary trials of a new antibiotic medicine for germ diseases, erythromycin or ilotycin, from the organism *Streptomyces erythreus*, was reported.

Mass testing to detect drunken drivers was promised by a 25-minute, two-step test.

A new test to tell whether a person died of drowning or was dead before his body was thrown or fell into the water was announced.

Significant chemical and clotting differences in blood and in kidney secretions of multiple sclerosis patients from normal patients were discovered.

A plastic artificial kidney performed outstandingly in trial on several patients suffering from acute kidney failure.

Starting Aug. 13, all bread in interstate commerce in the U. S. was standardized legally for the first time in the nation's history.

Resistance to a virus is inherited as a dominant in accordance with the Mendelian laws of inheritance, it was reported.

The 1952 Nobel prize in medicine and physiology was awarded to Dr. Selman A. Waksman of Rutgers University, discoverer of streptomycin and other antibiotics.

#### PSYCHIATRY-PSYCHOLOGY

### Chemical Injection Brings Patients From Trance

Injection of a body chemical, cholinesterase, into the brain brought patients out of the catatonic trance of schizophrenia, a discovery promising new knowledge of what goes wrong chemically in mental illness.

Photoshock, treatment with an intermittently flashing light in combination with a sensitizing drug, and electrostimulation, treatment with a non-convulsive dosage of electric current, were tried out with some success on the mentally ill.

Removal of the adrenal glands was found, in a few cases, to give temporary improvement to mental patients.

Anguish felt by mental patients was attributed to a substance in the blood which sensitizes some of the brain tissue of susceptible persons.

Metrazol given by mouth caused improvement in mentally ill old persons with arteriosclerosis.

Mental illness, and especially schizophrenia, is more prevalent as the social level goes down, a survey showed.

A systematic study of children's responses to the Rorschach test demonstrated distinctive developmental patterns for all ages from two through ten years.

A kind of homesickness in reverse, termed "nostopathy," was found to affect persons returning home after military service or other prolonged absence.

Quarrelsome tendencies can be influenced more by inheritance than by learning, experiments with mice indicated.

Chronic fear, or anxiety, was found to have an effect on the stomach just opposite to that of acute fear—secretion of hydrochloric acid in the gastric juice is increased.

The chemical steps that make vision possible—bleaching of light-sensitive pigments in the retina and restoration of the pigment—were duplicated in the laboratory.

That previous experience in seeing is important to perception was shown by an experiment in which ring doves hooded from birth required more time to learn to distinguish geometric forms than normally raised birds.

Mesopic vision tests made in a cloudy moonlight illumination were found to correlate so closely with night vision tests that they can be

#### PUBLIC HEALTH

## Nerve Gas As Food Poison

**Contamination of food with nerve gases could kill hundreds of people before discovery. Simple chemical kit for detecting chemical warfare agents being developed.**

► **EXTREMELY DEADLY** nerve gases may be used to poison wartime food supplies, Dr. Thomas H. Alphin, chemical warfare consultant of the Federal Civil Defense Administration, warned the National Food and Nutrition Institute meeting in Washington.

A few drops of the liquid form of nerve gases on the skin, if sufficiently concentrated, can cause death in a few seconds.

The highly toxic nerve gases are almost odorless, colorless and tasteless, and cannot be detected by the ordinary human senses until their deadly effects are felt. Contamination of food with nerve gases could kill hundreds of people before it is discovered, and make great quantities of provisions unusable.

Nerve gases can be spread by mortar shells, artillery shells, rockets or aerial bombs. Besides direct attack, nerve gas bombs could be planted by saboteurs for contaminating stores of food and other goods, as well as for anti-personnel purposes.

The Federal Civil Defense Administration is developing a simple testing kit for use in detecting nerve gases and other chemical warfare agents, Dr. Alphin said.

Atomic and biological warfare may also be waged against food supply, the National Food and Nutrition Institute was told.

Dr. Vincent B. Lamoureux, radiological defense consultant of the Civil Defense Administration, said atomic warfare will cause greatest damage to food supply in the initial blast and fire of the explosion. The tendency in American cities to concentrate warehouses and processing plants in the same area increases the danger here, he said.

substituted for them in testing service personnel.

When gradually increasing electric currents were passed through the amalgam filling in teeth, a new sensation was experienced before the threshold of pain was reached.

Study of a wide variety of animals showed that all are sensitive to sweets.

What you experience with the sense of touch was found to interfere with your judgment of what you perceive visually.

The waking mechanism of the brain was located in the central core of the brain stem at the top of the spinal column.

A white rat is much more intelligent than has been thought and can be used instead of men in tests of the hazards of future flying, a new method of testing showed.

Tiny, one-celled paramecia can be trained, it was discovered, and their capacity for learning is related to heredity.

Radioactive contamination, however, is the new, unfamiliar result of atomic attack, he said, and may make otherwise unharmed foods completely unusable and possibly dangerous.

Biological attack, using insect pests and plant and animal diseases, may be used against our total food supply, said F. K. Erickson, acting chief of the emergency sanitation branch of the Civil Defense Administration.

But bacteriological contamination of prepared foods as a weapon of war may be an even greater danger, he said. It is not unlikely, for instance, that saboteurs could place infectious disease germs in the food supply of large numbers of people, resulting in their sickness or death and the spread of disease.

Science News Letter, December 20, 1952

#### AERONAUTICS

### Cheaper Troop Transport By Air Than by Water

► **IT IS** cheaper to transport troops from England to overseas bases by British merchant airliners than by troopships on the ocean, according to a statement in London accredited to the British Secretary of State for Air. It would cost about \$11 less to fly a serviceman from England to the Middle East than to take him by boat.

As new jet and turboprop airliners come along, costs will be reduced substantially, it is claimed. The chief of air staff is reported to have said recently that two long-range, four-engined jet transports, with two in reserve, could lift in a year, between the United Kingdom and the Middle East, more troops cheaper than two of the latest troopships.

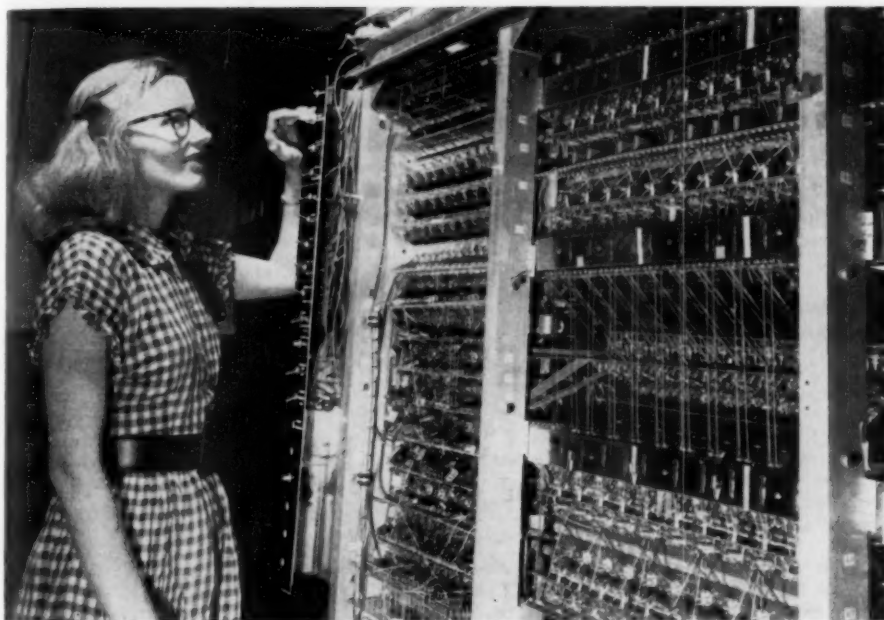
For troop transportation a fleet of Britannias, powered by turboprops, is proposed. On a non-stop flight between Britain and the Middle East, each of them could carry 130 to 140 fully equipped men at a cost of about \$42 per man per journey. The flight would take about seven hours. This cost is considerably below those on conventional aircraft and far less than surface costs.

The advantages of air troopship do not stop with the lower cost, it is stated. The speed of air transport also brings with it far greater mobility, because troops are not tied up in transit and can go rapidly to where needed. As mobility improves, a greater area can be covered with the same number of troops, or fewer troops can cover a particular geographic area.

Science News Letter, December 20, 1952

Science News Letter, December 20, 1952





**WEATHER FORECASTS BY COMPUTER**—Called the Maniac, this electronic computer at the Los Alamos Scientific Laboratory, N. M., is one of the few in the world fast enough to do numerical weather forecasting. It is the same type as the machine at the Institute of Advanced Study, Princeton, N. J., on which experiments with numerical weather forecasting are now being carried out.

## METEOROLOGY

## "Brains" Get Weather Trial

► **ELECTRONIC "BRAINS"** to predict the weather five days in advance will probably be tried out at the U.S. Weather Bureau in the next year.

This will be the first application of the new numerical forecasting system to long range forecasts. However, it will be on a highly experimental basis, with practical use still years away, it was said.

"We have set up several research projects to determine the feasibility of adapting numerical forecasting to longer range periods," Dr. Harry Wexler, director of the Bureau's Scientific Services, told *SCIENCE SERVICE*. "Right now the complicated and numerous calculations are being done by hand, but we hope next year to have the funds for purchase or rent of an adequate electronic computer."

The project will be carried out in the Extended Forecast Section, which now regularly issues five-day and 30-day weather predictions, based on the "old-fashioned" synoptic method. Jerome Namias, head of the section, and Philip Clapp, who will actually carry out the numerical projects, see good chances of success for their research. Mr. Clapp is just back from a year's study of numerical forecasting in Sweden under Dr. Carl-Gustav Rossby, the father of modern meteorology.

Mr. Clapp has found that the same formulas used for 24-hour numerical predictions can probably be used for predicting

the weather over an average of five days in advance. In addition, he can use a longer time interval, so the number of predictions made by the electronic "brain" are the same as in a 24-hour forecast. Right now, he is working on several problems which, successfully solved, would prove this more conclusively.

*Science News Letter, December 20, 1952*

## ASTRONOMY

## Russian Book Gives Planet Data to Americans

► A **SCIENTIFIC** book published at Moscow is being circulated in the United States. And just in case you cannot read Russian, it is accompanied by an English translation.

Designed to help astronomers keep track of minor planets as they wander across the skies, the volume of elements and ephemerides of the minor planets for 1953 was compiled at the Institute of Theoretical Astronomy at Leningrad.

To avoid duplicate effort and expense of editing and printing, the annual volume usually published by the Cincinnati Observatory will not be issued this year. Instead, the Russian volume is being distributed as widely as possible, supplemented by a translation of the text into English by Dr. Peter Musen of the Observatory.

*Science News Letter, December 20, 1952*

## MEDICINE

## Radioactive Iodine Gets Into Mother's Milk

► **DOCTORS** WERE warned that it may be dangerous to give radioactive iodine to mothers while they are breast feeding their babies.

The warning came in a report by Drs. Carl E. Nurnberger and Alys Lipscomb of the University of Tennessee College of Medicine, Memphis, to the *Journal of the American Medical Association* (Dec. 6).

Enough of the radioactive chemical gets into the mother's milk to allow a sizable amount to be taken up by the baby's thyroid gland. If the radioactive iodine is being given the mother for treatment of thyroid trouble, the baby might get so much that its thyroid gland would become "seriously" underactive or might even stop functioning completely.

If the chemical is given in tracer doses for diagnosis of possible thyroid trouble in the mother, enough of it would be diverted via the milk to the baby so that the result of the test might be inaccurate.

In one of the cases reported by the Memphis doctors, the baby's thyroid gland had taken up five percent of the diagnostic tracer dose of radioactive iodine given the mother 24 hours previously, while the mother's gland had taken up 34%. Tests of the mother's milk showed some of the radioactive iodine present in it.

*Science News Letter, December 20, 1952*

## SURGERY

## Patch Half-Dollar Size Hole in Boy's Heart

► A **13-YEAR-OLD** boy with a hole in his heart the size of a half dollar has had it patched with a piece of the fibrous sac that encloses the heart.

This new bloodless operation was performed at the Indiana University Medical Center, Indianapolis, following 16 months of surgical research supported by the James Whitcomb Riley Memorial Association and the Office of Naval Research.

The hole in the boy's heart was between the right and left auricles. The left auricle is the heart chamber that receives oxygen-rich blood from the lungs to be pumped through the ventricle to the rest of the body. The right auricle receives blood from the veins after it has given up its oxygen. As a result of the opening between the two auricles, the boy's heart was enlarged and he was in a state of chronic heart failure.

The operation devised by the Indiana University surgeons does not interfere with the functioning of the heart or require artificial means of maintaining blood circulation while the delicate operation is being performed.

The 13-year-old who has just undergone this operation is Harold Richard Duffy, son of Mr. and Mrs. Clifford Duffy of Linton, Ind.

*Science News Letter, December 20, 1952*

# • Books of the Week •

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. books in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N. W., Washington 6, D. C. Request free publications direct from publisher, not from Science Service.

**ASSOCIATED MEASUREMENTS**—M. H. Quenouille—*Academic Press-Butterworths*, 242 p., \$5.80. A statistical work concerned with old and new methods for dealing with associations between measurements, especially quantitative measurements.

**BEYOND HUMAN KEN**—Judith Merril, Ed.—*Random House*, 334 p., \$2.95. In this science fiction anthology, you will meet new and strange forms of intelligent life.

**BIRDS IN THE MUSEUM GARDEN**—Irving Black—*Newark Museum*, 12 p., illus., paper, 50 cents. This small spot, hemmed in by city buildings, is a favorite resting and feeding place for migrating birds.

**BOWEN VOLUME, AMERICAN JOURNAL OF SCIENCE**—Chester R. Longwell and John Rodgers, Eds.—*American Journal of Science*, 627 p., in two parts, illus., paper, \$6.00. Papers on minerals presented in honor of Dr. Norman L. Bowen on the occasion of his retiring from the staff of the Geophysical Laboratory.

**CHEMISTRY OF FOOD AND NUTRITION**—Henry C. Sherman—*Macmillan*, 8th ed., 721 p., \$6.00. A new and thoroughly revised edition of a well-known college text.

**CHILDREN CAN WORK INDEPENDENTLY**—Constance Carr, Ed.—*Association for Childhood Education International*, 35 p., illus., paper, 75 cents. On methods of treating the child to develop self-reliance.

**CURRENT ROAD PROBLEMS: Curing of Concrete Pavements**—*Highway Research Board*, 19 p., paper, 30 cents. Presenting current recommended practice.

**DICTIONARY OF GAMES: Outdoor, Covered Court and Gymnasium, Indoor**—J. B. Pick, Ed.—*Philosophical Library*, 318 p., \$4.75. Information about games played in Britain (and other places) for those who "expect to find themselves in a field with a ball and six children" or "in a drawing-room with a grandmother, two aunts and a pack of cards."

**THE EARTH: Its Origin, History and Physical Constitution**—Harold Jeffreys—*Cambridge University Press*, 3d ed., 392 p., illus., \$13.50. Four chapters on the origin of the Solar System have been deleted from this edition because the theory developed in them needed drastic revision. Other chapters have been greatly revised and enlarged.

**THE FIRST BOOK OF PUPPETS**—Moritz Jagendorf—*Franklin Watts*, 67 p., illus., \$1.75. Telling boys and girls how to make and operate various types of puppets.

**A FURTHER STUDY OF VISUAL PERCEPTION**—M. D. Vernon—*Cambridge University Press*, 289 p., illus., \$7.00. The author shows how the individual disregards minor variations in the environment if these affect his impression of a stable external world.

**A HAND-OPERATED NIBBLER FOR THE BRACE SHOP**—John L. Young—*Mellon Institute*, 2 p.,

illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The nibbler is a special kind of punch with which an irregular line can be followed.

**IMPROVEMENT OF NICKEL CRACKING CATALYSTS**—C. H. Ries, H. A. Dirksen and W. J. Pleticka—*Institute of Gas Technology*, 28 p., illus., paper, \$3.50. Periclase, it was found in these studies, is as satisfactory as alumina as a support for the nickel.

**INTERIOR DECORATING FOR YOU**—Florence B. Terhune—*Barrows*, 284 p., illus., \$4.95. A book for brides or others who wish to make a house into a home.

**KNOW YOUR CARBURETOR**—Research Staff, Guinout Division—*Pennsylvania Refining Company*, 46 p., illus., paper, free upon request direct to publisher, 2695 Lisbon Road, Cleveland 4, Ohio. Helpful information for car owners.

**THE LAPOINTE MACHINE TOOL COMPANY AND UNITED STEELWORKERS OF AMERICA**—George P. Shultz and Robert P. Crisara—*National Planning Association*, Case Study No. 10, Causes of Industrial Peace Under Collective Bargaining, 81 p., paper, \$1.00. Telling how a long and costly strike was followed by a period of industrial peace.

**LIFE AND LETTERS OF R. A. F. PENROSE, JR.**—Helen R. Fairbanks and Charles P. Berkey—*Geological Society of America*, 765 p., illus., \$4.00. The story of the life of a man who left about ten million dollars to be divided equally between the Geological Society of America and the American Philosophical Society. This volume is a memorial to him.

**LIFE INSURANCE FACT BOOK 1952**—Virginia Thompson Holman—*Institute of Life Insurance*, 107 p., illus., paper, single copies free upon request direct to publisher, 488 Madison Ave., New York 22, N.Y. Statistics on the life insurance business for students and others.

**MEMORIAL CENTER FOR CANCER AND ALLIED DISEASES, Annual Report 1951 to 1952**—Reginald G. Coombe and Laurance S. Rockefeller—*Memorial Center*, 157 p., illus., paper, free upon request to publisher, 444 East 68th St., New York 21, N.Y. Reporting development of new and safer operations for the cure of cancer, and steady gains toward the control of widespread or inoperable cancer.

**MICROBIAL GROWTH AND ITS INHIBITION: First International Symposium on Chemical Microbiology**—Cyril N. Hinshelwood and others—*World Health Organization (Columbia University Press)*, 285 p., illus., paper, \$3.00. Eighteen of the papers presented at a meeting to mark the inauguration of the International Research Centre for Chemical Microbiology.

**THE NEW DICTIONARY OF AMERICAN HISTORY**—Michael Martin and Leonard Gelber—*Philosophical Library*, 695 p., \$10.00. Historic names, places and events listed in alphabetical order and described.

**PARKING: How It Is Financed**—E. Earl Duffy and D. Grant Mickle—*Automotive Safety Foundation*, 47 p., illus., paper, 75 cents. Reporting what is being done to solve this problem in various parts of the United States.

**PHYSICAL CHEMISTRY**—Frank H. MacDougall—*Macmillan*, 3d ed., 750 p., illus., \$6.00. Chapters on atomic structure and reaction kinetics have been revised.

**PHOTOCONDUCTIVITY IN THE ELEMENTS**—Trevor Simpson Moss—*Academic Press-Butterworths*, 263 p., \$7.00. Metals, which are good conductors of electricity, are opaque to light but good reflectors. Insulators are generally transparent in the visible region and are poor reflectors. Semiconductors are generally opaque in the visible but transparent in the near infrared region.

**PICTURE PRIMER OF DOORYARD GARDENING: From City Plot to Country Acre**—Margaret O. Goldsmith—*Houghton Mifflin*, 48 p., illus., \$2.00. Any homemaker will have pleasure in trying to make the yard look like the lovely color illustrations here.

**RADIO & TV HINTS**—Martin Clifford, Ed.—*Gernsback*, 112 p., illus., paper, \$1.00. New uses for common tools and materials, and new ways of doing things that may come in handy for you.

**STAFFING THE PRESIDENCY**—Bradley D. Nash—*National Planning Association*, 78 p., illus., paper, \$1.00. Recommendations for streamlining the Executive Offices of the President of the United States.

**SUPERCONDUCTIVITY**—D. Shoenberg—*Cambridge University Press*, 2d ed., 256 p., illus., \$6.00. Since the discovery of superconductivity, it has been found that 21 metallic elements and a large number of alloys become superconducting, the transition temperature being characteristic of the particular metal.

**WORKING WIVES AND MOTHERS**—Stella B. Applebaum—*Public Affairs Committee*, 32 p., illus., paper, 25 cents. More than 40% of all mothers with school-age children work. The author stresses the need for better community services such as child care centers.

**YOUR COMMUNITY'S HEALTH**—Dean Franklin Smiley and Adrian Gordon Gould—*Macmillan*, 454 p., illus., \$5.50. This revision of "Community Hygiene" is intended to help individuals in all stations of life to visualize better the wonderful possibilities in community health improvement.

Science News Letter, December 20, 1952

## CHEMISTRY

### Local Anesthetic More Powerful Than Procaine

► **SYNTHESIS OF** a new local anesthetic more powerful than procaine and about twice as safe is announced by Dr. Emil Hofstetter of Edward Geistlich and Sons, pharmaceutical manufacturers of Lucerne, Switzerland.

The new synthetic painkiller, besides being more active in guinea pigs than procaine, or Novocain, showed only half the toxicity of procaine in tests with mice, Dr. Geistlich states in *Nature* (Dec. 6).

Science News Letter, December 20, 1952



## AERONAUTICS

# Wing Shape Speed Factor

XF-91, combining jet and rocket thrust, makes the first faster-than-sound flight of any U.S. fighter plane completely equipped for combat.

## See Front Cover

► THE UNUSUAL shape of the wings of the new Air Force XF-91 combat-type fighter plane, which has already made flights faster than the speed of sound, may be the forerunner of wings of the future for supersonic aircraft.

The wing is what is called an inverse taper type. It is wider at its tip than at its base where it joins the fuselage. It was adopted for this plane because earlier flight tests showed conclusively that it successfully reduces wingtip stalls due to loss of lift, which is normally experienced with conventional tapered wings.

The inverse taper combined with leading edge slots makes possible flying at speeds lower than that possible with other jet fighter planes. This gives the XF-91 a double advantage, a low speed for landing and at other times when desired, and a high speed when needed. In addition, extra thinness of the wing at the fuselage junction reduces drag and permits a more even flow of air at this point.

Another feature of the wing is important. It is a sweptback type with variable positions permitting a high angle of attack for take-offs and landings and a low angle of attack for high speed flights.

The new plane, rated in the 700-mile-per-hour class, is a product of Republic Aviation Corporation, Farmingdale, Long Island. Its primary power is a General Electric J-47 jet engine which has a thrust of 5,200 pounds, to which more can be added by an afterburner. Very important, however, is its supplementary rocket power. It is equipped with a rocket engine manufactured by Reaction Motors, Inc., Rahway, N. J., which has a 6,000-pound thrust and gives the extra power for supersonic speeds.

The Republic XF-91, with a span of about

31 feet and a length of 43 feet, is classed as a high-altitude, high-speed interceptor, able to meet and defeat any high-speed bomber that might attack American forces. It is a combat-ready airplane, but for some time it is to be used in research flights.

The plane is shown on the front cover of this week's SCIENCE NEWS LETTER, equipped with external fuel tanks, during a flight over Edwards Air Force Base, Calif.

Science News Letter, December 20, 1952

## GENERAL SCIENCE

## Recent Plastics Make Christmas Tree Bright

► YOUR CHRISTMAS tree this year will probably be gayer because of materials recently developed.

Bells, canes and snow men of foamed plastic are finding their way onto the home evergreen. Plastic modeling material that can be hardened in the oven enables you to design your own ornaments.

How different the Christmas trees today look from those of our grandparents who adorned their evergreens with festoons of cranberries threaded like beads and with strings of popcorn. The apples and nuts, cakes and candles, red strips of paper and bits of soft cotton that gave European Christmas trees a festive appearance in the early days are now seldom seen.

Christmas tree ornaments were first made of glass in the middle of the nineteenth century, in a little town of olden Germany. They continued to be hand-made until 1939, when machines similar to those used in manufacturing electric lights first began turning them out by the millions here in the United States.

Several interesting Christmas tree ornaments or materials for making them are included in the December unit of THINGS of science, just issued by SCIENCE SERVICE. They include a durable glass pine cone, plastic modeling material that can be hardened in the oven, a small block of lightweight foamed plastic for carving a snow-white ornament, aluminum foil for cutting long, narrow strips used as Christmas icicles, and mica snow to make the tree glisten.

The kit, available for 75 cents, is complete with instructions for using the specimens, and directions for identifying the most common Christmas trees. Just write SCIENCE SERVICE, 1719 N St., N.W., Washington 6, D.C., and ask for the Christmas Tree Ornaments kit.

Science News Letter, December 20, 1952

## • RADIO

Saturday, Dec. 27, 1952, 3:15-3:30 p.m., EST  
"Adventures in Science" with Watson Davis, director of Science Service, over the CBS Radio Network. Check your local CBS station.

Dr. Kirtley F. Mather, professor of geology, Harvard University, and retiring president of the American Association for the Advancement of Science, discusses "The Common Ground of Science and Politics."

## INVENTION

## Patent Delayed 19½ Years by Security

► AN INVENTOR has now received a patent after waiting 19 and a half years for it.

Chester T. Minkler, a Newport, R. I., Navy employe, received patent number 2,617,703 for a torpedo recording mechanism for which he applied May 9, 1933. The patent application was not granted for security reasons, a Navy spokesman said.

The recorder is a camera fitted into a practice torpedo. It takes a picture of the target ship at the moment the torpedo is supposed to go off. It is used in torpedoes that explode when they come near a target without actually hitting it. This underwater "proximity fuse" torpedo, only revealed after World War II, was the reason for keeping the invention secret.

Science News Letter, December 20, 1952

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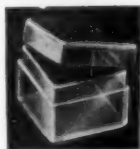
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## Questions

**AERONAUTICS**—What is a turbo-compound engine? p. 385.

In what way are the XF-91's wings unusual? p. 397.

...

**CHEMISTRY**—What is chlorophyll's esthetic value? p. 386.

...

**MEDICINE**—How can radioactive iodine be dangerous to nursing mothers? p. 395.

...

**METEOROLOGY**—When is numerical forecasting expected to get a trial? p. 395.

...

**NUTRITION**—How much more is the average American eating now than pre-war? p. 388.

...

**SURGERY**—How can patients with aneurysm of the aorta now be saved? p. 386.

...

Photographs: Cover, Republic Aviation Corporation; p. 387, Atomic Energy Commission; p. 389, U. S. Air Force; p. 390, British Information Services; p. 391, Brookhaven National Laboratory; p. 392, General Electric Co.; p. 393, University of Wisconsin; p. 395, Los Alamos Scientific Laboratory; p. 399, Chrysler Corp.; p. 400, Tennessee Eastman Co.

## Do You Know?

For its protein value, rats, mice and some insects eat *glue* made from animals.

If it is not caught, the *lobster* will live about 50 years.

Including the widowed and divorced, the proportion of married American *women* now is at a record high.

Fuel oil *fires* occurring in storage tanks can be reduced in intensity and sometimes can be snuffed out completely if air is bubbled through the tank from the bottom.

Said to be the smallest in existence, a recently developed electrical *transformer* weighs only 1/100 ounce complete with its protective casing.

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### GENERAL SCIENCE

## Top 1952 Science Stories

► THE TOP ten important advances in science and technology during 1952 as picked by Watson Davis, director of SCIENCE SERVICE, are:

1. Successful testing of the hydrogen bomb or thermonuclear weapon and hints that its fusion reaction might be applied to peaceful uses.

2. Development of the most powerful anti-malaria drug, Daraprim (pyrimethamine), which holds the possibility of eradicating the world's number one disease.

3. Use of a new drug, isoniazid, in the treatment of tuberculosis with promising results.

4. Three promising approaches to polio protection: gamma globulin and two virus vaccines.

5. Detection by visual and radio tele-

scopes of spiral arms of the Milky Way galaxy, in which sun and earth are located.

6. Design of an atomic accelerator or cyclotron which will develop 100 billion electron volts.

7. Discovery that Jericho has had a continuous history of 6,000 years which makes it the world's oldest town.

8. Progress toward forecasting daily weather by processing great masses of numerical data through electronic calculators.

9. First jet airliners went into commercial international service.

10. The formation of petroleum at the present time in off-shore marine sediments demonstrated chemically and by radio-carbon dating, exploding theory that oil formation requires millions of years.

Science News Letter, December 20, 1952

### INVENTIONS

## Patents of the Year

Numbers following items are U. S. Patent numbers. Printed copies of patents can be obtained from the U. S. Patent Office at 25 cents each. Order by number, do not send stamps, and address order to the Commissioner of Patents, Washington 25, D. C.

Notable and interesting inventions patented during the year include:

An improved method of extracting uranium from bituminous shales that will substantially increase the yield. Patent 2,597,504.

The synchro-cyclotron, one of the most powerful atom-smashers. Patent 2,615,129.

New germanium alloys with gases and metals, and rectifiers made from the alloys. Patents 2,588,253 and 2,588,254.

A new system of making movies by first televising the scene and then photographing the result, thus making possible lighting by lamps of lower intensity. Patent 2,607,845.

A system for sending full color pictures over wirephoto or radiophoto circuits in a single transmission. Patent 2,598,504.

A system of five lenses for large-scale projection of television pictures without loss of sharpness. Patent 2,586,866.

A method of transmitting television over long distances by using flying airplanes as relay stations. Patent 2,598,064.

"Sofar," a method of transmitting sounds thousands of miles through ocean water, using a sound channel located at about 4,200 feet under the surface. Patent 2,587,301.

A computer in a torpedo which figures out the course and speed of a target ship and corrects the torpedo's course to correspond. Patent 2,600,159.

A method for making relatively heavy crude oil out of coal while it is still underground, and then pumping it out for refining into motor fuel. Patent 2,595,979.

A process for doubling the amount of insulin extracted from animal pancreas glands, for use in treatment of diabetes. Patent 2,595,278.

Steps in the ultimate synthesis of cortisone. Patents 2,596,562 and 2,596,563.

Use of soybean as basis for a glue suitable for high-grade, low-cost fiberboard. Patent 2,580,391.

Means of strengthening taconite pellets by addition of starch or sodium silicate. Patent 2,596,132.

Five new titanium alloys that will add to the strength of this defense-important metal, which is already twice as strong as many steels. Patents, 2,596,485 through 2,596,489.

Exhaust circuits in buildings to take away deadly fumes in case of fire. Patent 2,586,797.

A radar system which can be used from airplanes for contour aerial mapping and can be used over water to develop a contour of the underwater surface. Patent 2,616,077.

A bullet-proof, self-sealing gasoline tank for military aircraft made of silk, wool or other cloth with self-sealing liner. Patent 2,601,525.

An automatic control system that feathers the propeller blades of an airplane when an engine fails. Patent 2,605,849.

A water-repellent glass cloth for use in clothing, tents and awnings. Patent 2,604,688.

A pilot's suit made of diagonally woven mesh to provide proper pressure for combating effects of gravity at extremely high speeds. Patent 2,605,065.

An automatic radio weather station to transmit meteorological data from unmanned observation posts. Patent 2,605,343.

A "three way" antibiotic preparation to fight infection by successive attacks by sulfadiazine, penicillin and sulfamerazine. Patent 2,602,038.

Sterilization of raw canned foods by use of high frequency radio waves. Patent 2,576,862.

An automatic headlight control which dims the lights at the approach of a car in the opposite direction. Patent 2,615,079.

Non-electrolytic method of coating aluminum with rust-resisting zinc. Patent 2,580,773.

A typewriter that will type Chinese characters. Patents 2,613,795 and 2,613,794.

An improved ocean depth finder that determines depth by measuring the time necessary for ultrasonic impulses to bounce from the ocean bottom. Patent 2,599,586.

Science News Letter, December 20, 1952

New 1953-model cars carry an average of 30 light bulbs each.



## MEDICINE

# Trace Cancer Spread

Intravenous injections of human serum albumin combined with radioactive iodine can be used to spot cancer of the liver only.

► THE SPREAD of cancer from other parts of the body to the liver can be traced by a promising new method developed by three University of California at Los Angeles scientists and reported at the Radiological Society of North America meeting in Cincinnati.

The technique was developed at the Los Angeles Veterans Administration Center by Drs. Lloyd A. Stirrett and Eric T. Yuhl of the surgical staff and Dr. Raymond Libby, consultant physicist.

The method involves the use of small, intravenous injections of human serum albumin combined with radioactive iodine. For some reason, cancerous tissue takes up more of the radioactive iodine than normal tissue.

A scintillation counter, an instrument much more sensitive to the gamma radiation from radioactive iodine than a Geiger counter, is used to detect the malignant area. The scintillation counter was developed at the U.C.L.A. Atomic Energy Project. It has been used with considerable success by Drs. Yuhl and Stirrett for the diagnosis of brain tumors.

To date, the test has been applied to more than 150 patients with proved cancers

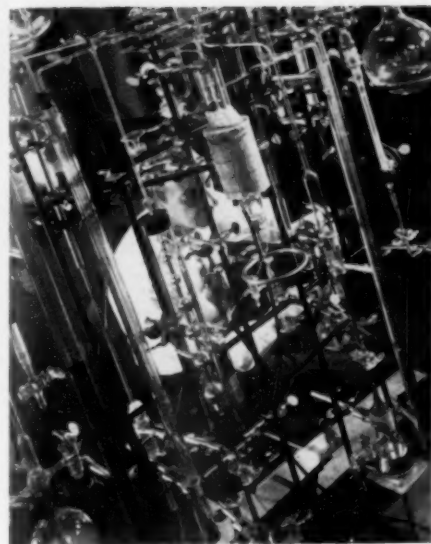
and has been 95% accurate in diagnosing whether or not the cancer has spread to the liver. Occasional false positives occur in patients with diseases which produce accumulations of fluid within the abdomen.

The test takes only 20 minutes to perform, is harmless and there is no discomfort whatsoever to the patient. It has been used extensively in the surgical department of the Veterans Administration Hospital in the study of patients before and after cancer surgery.

The doctors emphasized that this procedure is not a test for cancer in general, but only for cancer of the liver.

As for the future possibilities of the technique being used to locate cancer anywhere within the body, the researchers are uncertain. Their work has only been concerned with cancer that spreads to the liver from other sources. Investigations along this line are planned, but the doctors emphasize that it may be several years before its application for the general diagnosis of cancer can be determined.

Science News Letter, December 20, 1952



**MAKING THINGS STICK**—Using the gas adsorption apparatus shown here, scientists at the Chrysler Corporation, Detroit, are trying to tell how strongly molecules cling to surfaces under very pure conditions.

## BIOCHEMISTRY

## Male Hormone Change By Cancer Cells Irregular

► BETTER RESULTS from male hormone treatment of cancer are expected as a result of studies by Dr. Henry M. Lemon and associates of Boston University School of Medicine.

A method has been developed by these scientists "for determining the chemical action between cancer cells and male sex hormones," the American Cancer Society, which supports the research, has announced. It involves the use of chromatography.

Normal tissue, the scientists find, changes male hormone into other chemical compounds at a fairly uniform rate. Cancerous tissue changes the hormone at a rate that varies widely and has no uniformity.

Dr. Lemon reported the findings at a meeting of the American Federation for Clinical Research in New York.

Science News Letter, December 20, 1952

## ASTRONOMY

## Mrkos Makes Discovery Of Second Comet in 1952

► A NEW comet has been discovered in the constellation of Virgo, the virgin, visible from the United States in the early morning hours.

Of tenth magnitude, the comet was spotted close to the brightest star in the constellation of Virgo, Spica, which is the 16th brightest star in the sky. It is too faint to be seen with the naked eye or binoculars, but can be picked up by a small telescope.

The diffuse stellar object will be known as Comet Mrkos after its discoverer, Antonin Mrkos of the Astrophysical Observatory at Skalnaté Pleso, Czechoslovakia. This is the third comet to the astronomer's credit. The two others were also of the tenth magnitude. One was spotted in May, 1952, and the other in January, 1948.

Report of the Dec. 9 discovery was cabled by Miss J. M. Vinter-Hansen of Copenhagen University Observatory to Harvard College Observatory, clearing house for astronomical information in the western hemisphere.

When discovered, the comet's right ascension was 13 hours, 27.0 minutes; its declination, minus 11 degrees, 50 minutes.

Science News Letter, December 20, 1952

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# • New Machines and Gadgets •

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❁ **HOLIDAY CANDLE** glows throughout its entire base when lit. Coated with a frosty-looking casing that does not melt or drip, the candle is about three inches square at its base and burns for 200 hours.

Science News Letter, December 20, 1952

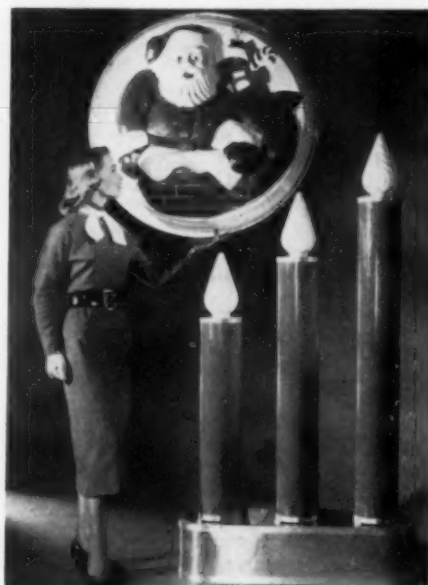
❁ **AUTO RACE** track and two racing cars give children a real thrill. Played by two, the inexpensive non-electric toy has a race track that is tilted by controls operated by each player. The controls can be used to speed your car around the track and to hinder your opponent's car.

Science News Letter, December 20, 1952

❁ **LENS THAT** clamps on light bulbs is said to throw three times more light into the selected area than the light bulb would throw there without it. Working on 25- to 100-watt lamps, the lens can be adjusted to put the concentrated light where it is wanted.

Science News Letter, December 20, 1952

❁ **CHRISTMAS DECORATIONS** for streets and buildings are made of a butyrate plastic and are lighted from within. For store windows, three big candles are set in an aluminum base, as shown in the photograph. The candles also can be attached to street lamp posts. A three-dimensional re-



lief plaque shows Santa entering a chimney.

Science News Letter, December 20, 1952

❁ **WHITE "BLACKBOARDS"** are designed especially for children. Eliminating chalk dust, the easy-to-see boards come com-

plete with special crayons that wipe off any washable surface. The board's kiln-dried wood frame is finished in a clear lacquer and is decorated with colorful decals of animals.

Science News Letter, December 20, 1952

❁ **SALAD SERVICE** sets, consisting of a wooden knife, fork and spoon, are hand-carved from Muuli and Musharagi woods by natives of Kenya Colony, Africa. Each handle is carved into the form of a native in ceremonial dress, his neck being trimmed with silvery-looking wire.

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❁ **KNIFE RACK** and sharpener holds six kitchen-type knives in vertical slots, and has a "three-second carbide sharpener" mounted in its center. Using a built-in pad impregnated with an adhesive, the device can be mounted on practically any flat surface, whether wood, metal, tile or glass.

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❁ **TOY ELECTRIC** generator is designed to be belt-driven by a toy steam engine. When running about 1,500 revolutions a minute, the generator creates enough alternating current to light a 3.8-volt flashlight bulb mounted in a nickel-plated standard.

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# • Nature Ramblings •

► **WE CAN** be more patriotically American in our Christmas shopping by "buying British" when it comes to holly.

This is not based on a semi-altruistic impulse to help our transatlantic ally by giving him our money for his wares. It is simply that if we buy English holly, we do not buy native American holly, and in that case we let our native American woods stand unrobbed to the degree of our abstention.

For the English holly offered in American markets is all cultivated, and helps to make an honest living for those who raise it. American holly, on the other hand, is almost always stolen; for the collectors and dealers are seldom the owners of the woods where the holly grows.

Even if they are, they are robbing themselves and their heirs, for stripping the woods of these bright-berried bushes and small trees leaves the next generation inevitably poorer.

Actually, when we purchase English holly on an American market stall, we are not

## Buy British!



"buying British" in the literal sense. The English holly we see here is not imported. It is the long-since-naturalized descendant of originally English ancestry—like an Alder or a Dwight or a Calvert.

The nurseries where holly is grown for the market are mainly in the Pacific Northwest, where the climate is most like that of northwestern Europe, although substantial amounts of English holly are grown also in some of the eastern states.

English holly can be distinguished from the native American species readily enough. It has bigger, brighter, redder berries and its leaves are a darker, glossier green, usually with somewhat spinnier margins. It looks more like the holly of Christmas-card paintings.

Holly, both English and American, is one of those peculiar plants that has its berry-producing, or female flowers, and its pollen-producing, or male flowers, on different bushes. This makes it necessary to have one otherwise unprofitable, because berryless, bush for every dozen or so of the berry-bearing bushes.

Plant physiologists, however, have now discovered a way to make berries develop from unpollinated female flowers, simply by spraying them with a dilute solution of one of the growth-promoting chemicals, or hormones. To be sure, these fatherless berries do not contain fertile seed, but that does not make any difference, so far as their ornamental appearance is concerned.

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